

REMARKS

This Amendment responds to the Office Action dated June 28, 2005 in which the Examiner rejected claims 1-3, 6, 9-12, 14 and 20-21 under 35 U.S.C. §102(b) and rejected claims 5, 7-8, 13, 15-16, 18-19 and 22-24 under 35 U.S.C. §103.

As indicated above, claims 1, 9 and 16 have been amended in order to make explicit what is implicit in the claim. The amendment is unrelated to a statutory requirement for patentability and does not narrow the literal scope of the claims.

Claim 1 claims a stator core, claim 9 claims a core back and claim 16 claims a method for producing a stator core. The stator core comprises a core back and a plurality of teeth. The plurality of teeth are arranged circumferentially on the core back and extend radially therefrom. The core back is at least one sheet of electrically insulated soft magnetic material arranged as a spiral. The core back includes openings, each associated with a tooth. A portion of each tooth is inserted into an associated opening.

Through the structure and method of the claimed invention having a core back including openings and having a portion of each tooth inserted into an associated opening as claimed in claims 1, 9 and 16, the claimed invention provides a stator core, core back and method of producing a stator core which improves the magnetic flux which will flow from each turn of the spiral core to a tooth. The prior art does not show, teach or suggest the invention as claimed in claims 1, 9 and 16.

Claims 1-3, 6, 9-12, 14, 20 and 21 were rejected under 35 U.S.C. §102(b) as being anticipated by *Workman* (U.S. Patent No. 4,698,539).

Workman appears to disclose a pole-supporting structure in a rotating D.C. electric motor or generator (hereinafter referred to for simplicity as "D.C. motors").

(col. 1, lines 13-15) As seen in FIGS. 2 and 3, the stator assembly comprises poles 14 and antipoles 15 secured by bolts 16 to a pole-supporting structure or yoke 13.

(col. 3, lines 3-5) The yoke 13 is formed, as will be described in greater detail hereinafter, from a single strip of magnetic material coiled on a mandrel and secured into a monolithic unit, for example by an adhesive between the turns of the coil or by welding the ends 19, 20 of the coil. (col. 3, line 11-15) The yoke is formed on a

mandrel 1 which in FIG. 4 is a cylindrical mandrel for forming a cylindrical yoke. A strip 10 of magnetic material such as annealed mild steel fed from a supply roll 9 is moved by guide rollers 7 through a degreasing fluid 8, between slitting cutters 5,6 between coating applicator rollers 3,4 and is wound around the mandrel 1, the leading edge of the strip 10 being trapped in a slit 2, in the surface of the mandrel 1.

(col. 3, lines 28-38) The slitting cutters 5,6 are arranged to provide sets of adjacent slits 11 spaced by margins 12 from the edge of the strip 10 and mutually spaced by a distance A (FIG. 5) which is substantially equal to the distance along the magnetic path between adjacent poles (either main poles or interpoles) of the D.C. machine.

(col. 3, lines 48-53) The coiled yoke 13 may be produced without the slits 11 shown in FIG. 5 but in this event the magnetic flux passing through each of the poles requires to traverse the laminations formed by coils of the yoke 13 in order to pass along the yoke 13 to the adjacent pole. Rapid changes in the pole flux may give rise to eddy currents where the flux passes through the wound laminated structure in a direction perpendicular to the plane of the laminations and for this reason it is preferred to introduce the slits 11. The slits 11 also mitigate the effects of eddy currents arising due to the D.C. supply being achieved by rectification of an A.C. supply. (col. 3, line 63 through col. 4, line 6)

Thus, *Workman* merely discloses securing poles 14 to yoke 13 using bolts 16. Nothing in *Workman* shows, teaches or suggests a core back including openings, each opening associated with a tooth and a portion of each tooth is inserted into an associated opening as claimed in claims 1 and 9. Rather, *Workman* teaches away from the claimed invention and inserts a bolt 16 through yoke 13 into hole 14. (i.e. a portion of each tooth is not inserted into an opening).

Since nothing in *Workman* shows, teaches or suggests inserting a portion of each tooth into an associated opening in a core back as claimed in claims 1 and 9, Applicant respectfully requests the Examiner withdraws the rejection to claims 1 and 9 under 35 U.S.C. §102(b).

Claims 2-3, 6, 10-12, 14, and 20-21 depend from claims 1, 9 and 16 and recite additional features. Applicants respectfully submits that claims 2-3, 6, 10-12, 14 and 20-21 would not have been anticipated by *Workman* within the meaning of 35 U.S.C. §102(b) at least for the reasons as set forth above. Therefore, applicant respectfully requests the Examiner withdraws the rejection to claims 2-3, 6, 10-12, 14 and 20-21 under 35 U.S.C. §102(b).

Claims 5, 8, 13 and 15 were rejected under 35 U.S.C. §103 as being unpatentable over *Workman*.

Applicant respectfully traverses the Examiner's rejection of the claims under 35 U.S.C. §103. The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, applicant respectfully requests the Examiner withdraws the rejection to the claims and allows the claims to issue.

As discussed above, since nothing in *Workman* shows, teaches or suggests the primary features as claimed in claims 1 and 9, applicant respectfully submits that

Workman would not have been obvious at least for the reasons as set forth above. Therefore, applicant respectfully requests the Examiner withdraws the rejection to claims 5, 8, 13 and 15 under 35 U.S.C. §103.

Claims 7, 16, 18, 19 and 22-24 were rejected under 35 U.S.C. §103 as being unpatentable over *Workman* in view of *Jack et al* (U.S. Patent No. 6,472,792).

As discussed above, *Workman* merely discloses a bolt 16 inserted into a pole 14 through a yoke 13. Nothing in *Workman* shows, teaches or suggests inserting a portion of each tooth into an associated opening in a core back as claimed in claim 16. Rather, *Workman* merely discloses inserting a bolt 16 through a yoke 13 into a pole 14.

Jack et al. appear to disclose a stator tooth 1 illustrated in FIGS. 1 and 3-6 has a stem 2 of constant cross-sectional area and a distal tip 3 of larger cross-sectional area than the stem 2. Preferably, the tooth 1 is made by compressing a soft magnetic powder material, such as Somaloy 500 made by Hoganas AB of Sweden. The stator tooth 1 has a proximal end portion 4 of the same cross-sectional area as (or less cross-sectional area than) the stem 2. A stator core-back section 5 illustrated in FIGS. 1, 2, 5 and 6 is of conventional shape except for a radial through-hole 6 having the same cross-sectional area as the proximal end portion 4 of the tooth 1 in FIGS. 1 and 3-6. The core-back section 5 may be made of the same material as the tooth 1, the surface of the hole 6 as well as the dimensions thereof being such as to enable a close fit with the proximal end portion 4 of the tooth 1 (col. 2, lines 31-46). In assembling a single stator section, the coil 7 is first slid on to the stem 2 of the tooth 1 from the proximal end portion 4 towards the distal tip 3. In order that this should be possible without any substantial gap existing between the coil 7

and the tooth 1 in the assembled state, stem 2 should have non-decreasing cross-sectional dimensions, i.e. substantially constant or increasing cross-sectional dimensions, from the proximal end portion 4 to the distal tip 3, i.e. along a length of the tooth corresponding to a winding slot. Also, the shape of the central hole of the coil 7 should correspond to the shape of the stem 2 (col. 2, lines 55-65).

Thus, *Jack et al.* merely discloses a stator core-back section 5 in which a tooth 1 is force fitted. Nothing in *Jack et al.* shows, teaches or suggests attaching a plurality of teeth to a core back by inserting a portion of each tooth into an associated opening in a core back as claimed in claim 16. Rather, *Jack et al.* merely discloses force fitting teeth in a stator made of plural sections.

Additionally, *Jack et al.* merely discloses a stator core-back section 5. Nothing in *Jack et al.* shows, teaches or suggests winding a sheet of electrically insulated soft material into a spiral in order to form a core back and attaching a plurality of teeth to the core back as claimed in claim 16. Rather, *Jack et al.* is a different technical field in which the stator is made of plural sections.

Furthermore, *Jack et al.* has teeth made of soft magnetic composites while the poles in *Workman* are made of a stacked plate. Therefore, Applicant respectfully submits that a person of ordinary skill in the art would not modify the stator disclosed in *Workman* for the stator having plural sections as taught by *Jack et al.* nor would they substitute the stacked plate poles of *Workman* for the soft magnetic composite teeth of *Jack et al.* Therefore, Applicants respectfully submit that in addition to the references not showing, teaching or suggesting features as claimed in claim 16, combination of the references is not possible. Therefore, Applicant respectfully requests the Examiner withdraws the rejection to claim 16 under 35 U.S.C. §103.

Claims 7, 18-19 and 22-24 recite additional features. Applicant respectfully submits that claims 7, 18-19 and 22-24 would not have been obvious within the meaning of 35 U.S.C. §103 over *Workman* and *Jack et al.* at least for the reasons as set forth above. Therefore, Applicant respectfully requests the Examiner withdraws the rejection to claims 7, 18-19 and 22-24 under 35 U.S.C. §103.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested. Should the Examiner find that the application is not now in condition for allowance, Applicant respectfully requests the Examiner enters this Amendment for purposes of appeal.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, applicant respectfully petitions for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge
our Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL PC

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